

## A NEW SPECIES OF THE GENUS ACOPHILA ON FICUS MICROCARPA L. FROM CHINA (HYMENOPTERA, AGAONIDAE)

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**Abstract** A new species, *Acophila quinata* sp. nov., reared from *Ficus microcarpa* Linnaeus in China is described and illustrated.

Type specimens are deposited in the Zoological Museum at Institute of Zoology, Chinese Academy of Sciences, Beijing.

**Key words** Agaonidae, *Acophila*, new species, China.

### 1 Introduction

From an ecological perspective, *Acophila* Ishii is phytophagous nonpollinating galling fig wasps. They gall the ovule to provide a food resource for larval development, feed on abnormally proliferating nucellus (Galil & Eisikowich, 1968), and therefore do not depend directly on the fertilization of flowers by pollinators, though they do compete with pollinators for the limited resources in figs. By inducing nucellar development and avoiding syconial abortion (Galil *et al.*, 1970), they keep the synchronization of fig production among crops or within the same crop, which therefore maintain the cycling of mutualism between fig and its pollinators and avoiding local extinction of wasps (Bronstein, 1992; Anstett *et al.*, 1997). They are also essential in many tropical and subtropical ecosystems by maintaining all year round production of figs (van Noort & Compton, 1999). Due to the absence of observational evidence, the role of the newly described species, *Acophila quinata* sp. nov., played in the mutualism of *F. microcarpa*, its pollinator *Eupristina verticillata* Waterston and other organisms in their ecosystem remains to be seen.

The production of this species was found to be highly variable among different seasons. Also, they tend to distribute on the top altitude level (– 200 mm) of the fig tree, which to some extent inhibits the sampling process. The specimens in the present paper are retrieved directly from syconial ovule galls in fresh figs and it is very difficult to get a whole specimen from the tiny gall without any physical torn out. Due to these inhibiting factors of sampling, the type species reported here consist of two specimens, which became a solid reason to report here.

### 2 Materials and Methods

This study is based on specimens reared from *Ficus*

*microcarpa* L. which were collected from Danzhou, Hainan, China, in 2006. The terminology generally follows that of Gibson (1997). Body length is measured in millimeters (mm). The other measurements are given as a ratio, examined with LEICA MZ 16 stereomicroscope using same magniscale to make them easy to compare and calculate. All the materials are card mounted specimens and the types are deposited in Institute of Zoology, Chinese Academy of Sciences (IZCAS), Beijing, China.

#### *Acophila* Ishii, 1934

*Acophila* Ishii, 1934: 8: 97. Type species: *Acophila mikii* Ishii.

*Acophila* Ishii; Bouček, 1988: 169; Yokoyama *et al.* 1998: 37–46; Chen *et al.* 1999: 62; Priyadarsanan, 2000: 56.

*Acophila* was erected by Ishii in 1934. Species of *Acophila* are nonpollinating galling fig wasps (external oviposition) in host *Ficus* (Moraceae) species in subgenus *Urostigma*, *Ficus*, *Pharinosyceae* and *Sycomorus*. (Dicotyledoneae, Urticales, Moraceae), such as *F. superba* var. *japonica*, *F. microcarpa*, *F. benjamina*, *F. altissima*, *F. aulocarpa*, *F. glaberrima*, *F. novoguineensis*, *F. prasnicarpa*, *F. gul.* and *Ficus sycomorus*, in Oriental, Australasian and Oceanic Regions (Bouček 1993).

Diagnosis. *Acophila* (Agaonidae, Epichrysomallinae) can be easily recognized by the following characters: 1) occipital carina distinctly present; 2) scutellum broadly bordering on mesoscutum. As far as we know, two species of the genus have been recorded in the world. Only one species, *Acophila microcarpa* Chen, was from *Ficus microcarpa* L. (Chen *et al.*, 1999).

*Acophila quinata* sp. nov. (Figs 1–5)

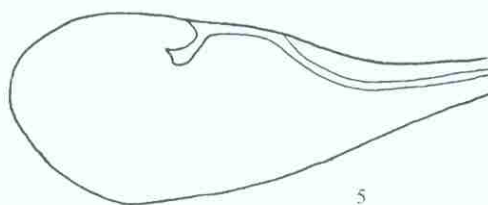
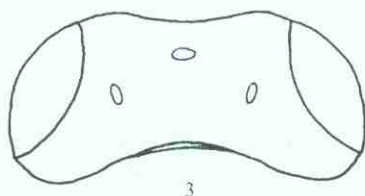
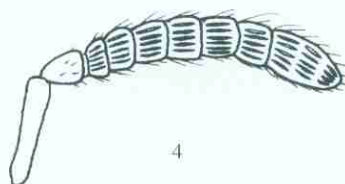
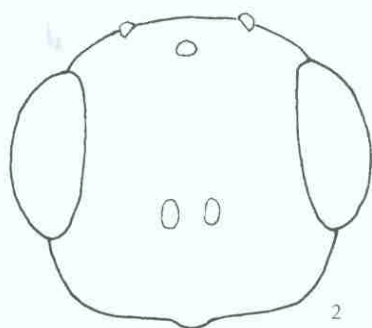
Holotype ♀, China, Hainan, Danzhou, July 2006, collected by HU Hao-Yuan and NIU Li-Ming. Paratype 1 ♀, same data as holotype.

Compare with *Acophila mikii* Ishii, 1934.

This project was supported by the Presidential Foundation of the Chinese Academy of Sciences, and partially by the key project of Innovation Program of CAS (KSCX1-SW 13), the National Science Fund for Fostering Talents in Basic Research (NSFG J0030092).

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Received 28 Feb. 2008, accepted 6 May 2008.



Figs 1-5 *Acophila quinata* sp. nov., ♀. 1. Body in lateral view. 2. Head in front view. 3. Head in dorsal view. 4. Antenna. 5. Fore wing.

Female. Body (Fig. 1) length 3 mm. Body blackish brown in general; antennae yellowish; mandibles brown; legs blackish brown except tibia and tarsi yellowish; wings hyaline with veins pale brown.

Face barely reticulate; vertex plain; clypeus lobate and slightly extruding (Fig. 2), its surface with 7-10 cilia; mandible tridentate, with 2 glands; labial palpi 3-segmented; maxillary palpi 4-segmented; scrobal channel shallow. Ocelli dorsally in an obtuse angle (Fig. 3). Antennae 0.8 mm, formula 1 116 (3) (Fig. 4); scape cylindrical; funicular segments almost equal in width and length, with distinct longitudinal sensilla. Relative measurements: head width: height as 2: 1; head width: dorsal length as 1.3: 1.0; head width: frontovertex

width as 1.4: 1.0; toruli to clypeal margin: toruli to median ocellus as 1: 1; eye height: length as 1.0: 1.3; head width: space between eyes as 1.8: 1.0; eye height: malar space as 2.2: 1.0; POL: OOL as 4.3: 1.0; eye length: temple as 2.3: 1.0; scape: radicle as 4: 1; scape width: length as 4: 1; scape length: pedicel length as 2: 1; pedicel width: length as 1: 1; funicular segment 1.3: 1.0; first funicular segment length: pedicel length as 1: 1; clava width: sixth funicular segment width as 1: 1; combined length of the last three funicular segments 2.8 × clava length; combined length of pedicel and flagellum 1.1 × head width.

Mesosoma smooth, with - 10 cilia, strongly curved dorsally, almost as wide as head. Pronotum transverse,

shorter than 1/2 length of mesoscutum; mesoscutum with notauli complete and distinct; axillae widely separated. Scutellum convex, frenal line distinct; middle of scutellum smooth. Dorsellum ribbon-like, distinct, narrower than 1/3 length of propodeum. Propodeum shorter than mid coxa. Fore coxa and femur distinctly inflated, with – 5-7 setae; tibia with a long slender subapical spur. Mid leg very slender, about 2 times the length of fore leg and 1/2 the width of fore femur; tibia with an apical spur. Hind leg robust, coxa and femur strongly inflated; tibia with 2 ventrally apical spurs and a series of 8-9 teeth on the posterior margin. Fore wing (Fig. 5) 1.8 mm, sparsely ciliated. Hind wing also sparsely ciliated, with 3 setae at the terminal of vein. Gaster with an invisible petiole, wider than breadth of mesosoma, shorter than head plus mesosoma. Gastral segments excised; third segment slightly longer than others; ovipositor indistinct. Relative measurements: pronotum width: length as 2.5: 1.0; mesoscutum width: length as 1: 1; scutellum width: length as 1.0: 1.2; propodeum width: medial length as 2.3: 1.0; fore tarsal segments in ratio as 1.3: 1.0: 1.0: 1.0: 2.0; mid tarsal segments in ratio as 3.0: 2.0: 1.3: 1.0: 2.5; hind tarsal segments in ratio as 2.5: 1.3: 1.3: 1.0: 2.5; submarginal vein: marginal vein as 2.5: 1.0; marginal vein: postmarginal vein as 8: 1; stigmal vein: postmarginal vein as 5: 1; gaster width: height as 1.5: 1.0; gaster width: length as 1.0: 1.2.

Male. Unknown.

Etymology. In females the forewing stigmal vein is 5 times as long as postmarginal vein, so the species is called “quinata”.

Discussion. *Acophila quinata* is similar to *Acophila mikii*, but may be distinguished by the length of forewing stigmal vein: forewing stigmal vein of *Acophila mikii* is 7 times as long as postmarginal vein, while forewing stigmal vein of *Acophila quinata* is 5 times as long as postmarginal vein.

Biology. Reared from the galls inside fruit of *Ficus microcarpa* L. The galls are much bigger than those of other Agaonids.

Distribution. China, Hainan.

# Key to *Acophila* species of *Ficus microcarpa* L.

1. Hind tibia with 1 ventral spur at apex ..... *Acophila microcarpa* Chen  
Hind tibia with 2 ventral spurs at apex ..... 2
2. Forewing stigmal vein 7 times as long as postmarginal vein .....  
..... *Acophila mikii* Ishii  
Forewing stigmal vein 5 times as long as postmarginal vein .....  
..... *Acophila quinata* sp. nov.

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## 宽盾榕小蜂属 (小蜂总科, 榕小蜂科) 及一新种研究

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摘 要 记述榕小蜂科宽盾榕小蜂属 *Acophila* 1 新种, *Acophila quinata* sp. nov., 本种育自小叶榕 *Ficus microcarpa* L. 榕果。研

关键词 膜翅目, 榕小蜂科, 宽盾榕小蜂属, 中国。

中图分类号 Q969.545.5

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